BRITISH COLUMBIA
MINISTRY OF FORESTS

Boundary
Timber Supply Area
Yield Analysis Report

March 1981

Nelson Forest Region

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BOUNDARY

TIMBER SUPPLY AREA

YIELD ANALYSIS REPORT

March 1981

Nelson Forest Region

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PREFACE

This report represents the initial stage in the Boundary Timber Supply Area (TSA) planning process. It assesses the forest resource in terms of the wood supply and the Province's interest in other resource uses. These other values, such as fisheries, wildlife, water and recreation are also the concern of other agencies. The Ministry of Forests interacts with these agencies in determining how best to maintain or enhance such values during timber harvesting.

The Ministry of Forests Act requires the Ministry to plan the use of the forest and range resources of the Crown in a manner which allow co-ordination and integration of timber, forage and other natural resource values in consultation and cooperation with other ministries and agencies of the Crown and with the private sector.

The Boundary TSA report is intended to assist the Chief Forester in setting a rate of harvest for the Timber Supply Area while recognizing this mandate. This yield analysis report is also used to assist the Forest Service in allocating cutting rights and in developing a 20-year TSA plan.

Comments on the report are invited and may be made to the Regional Manager at 518 Lake Street, Nelson, B.C., V1L 4C6, or to the District Manager at the Boundary District Office, Box 250, Grand Forks, B.C., V0H 1H0. Comments received before May 1, 1981 will be considered during the selection of the rate of harvest for the Boundary Timber Supply Area.

SYNOPSIS

The yield analysis for the Boundary Timber Supply Area (TSA) indicates that a harvest level of 695 000 cubic metres annually can be maintained for 120 years. This level is 13% above the Long Run Sustainable Yield and 17% above present Crown commitment.

The timber supply has the potential to increase as a result of the inclusion of problem forest types, stocking of NSR lands, intensive forestry and improved harvesting technology which will allow increased access and better utilization.

1.0 INTRODUCTION

The purpose of this report is to describe the results of the timber yield analysis of the Boundary TSA. It provides estimates of timber available during the short term (1980-1999) and an indication of the potential rate of harvest over the long term (200 years).

The determination of volumes available for harvest is explained. As well, opportunities for increasing the short term wood supply and the long term yield are discussed.

While the maps and volume estimates produced for TSA yield determination are accurate enough for that purpose, they cannot be used to make operational decisions.

For this analysis, certain assumptions were made:

1) Basic forestry will be practiced. This requires that the productive capacity of each site be maintained and that each stand harvested be promptly restocked with commerical tree species.

2) Timber on all slopes considered operable in this analysis, is in fact harvested and not bypassed.

3) Present stands of pine, fir, larch, spruce and balsam will not be harvested before they are suitable for sawtimber. Other stands will be harvested to reflect maximum fibre production. Stands regenereated during this planning period will be harvested to provide maximum fibre yield.

2.0 DESCRIPTION OF THE TIMBER SUPPLY AREA (TSA)

2.1 Location and Extent

The Boundary TSA, situated in the southwest portion of the Nelson Forest Region is one of seven TSAs (Figure 1).

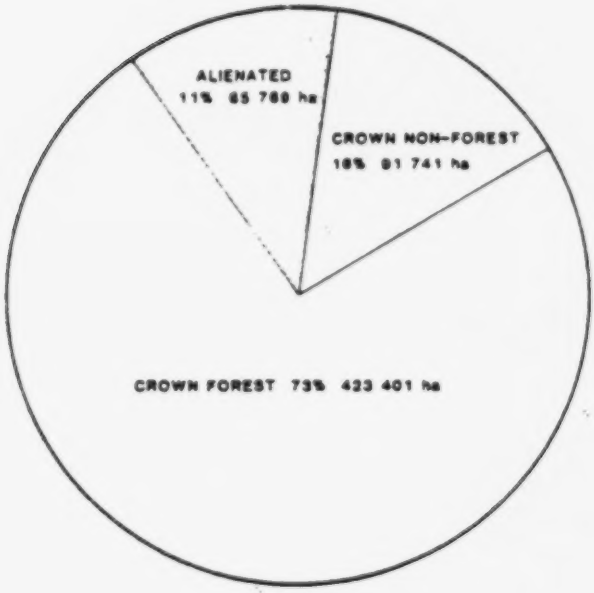
Figure 1

NELSON FOREST REGION TIMBER SUPPLY AREAS

The total area of the TSA is 581 000 hectares (Figure 2). The TSA includes the Granby Public Sustained Yield Unit (PSYU) and 77 percent of the Kettle PSYU.

Figure 2

AREA CLASSIFICATION - BOUNDARY TSA



2.2 Topography

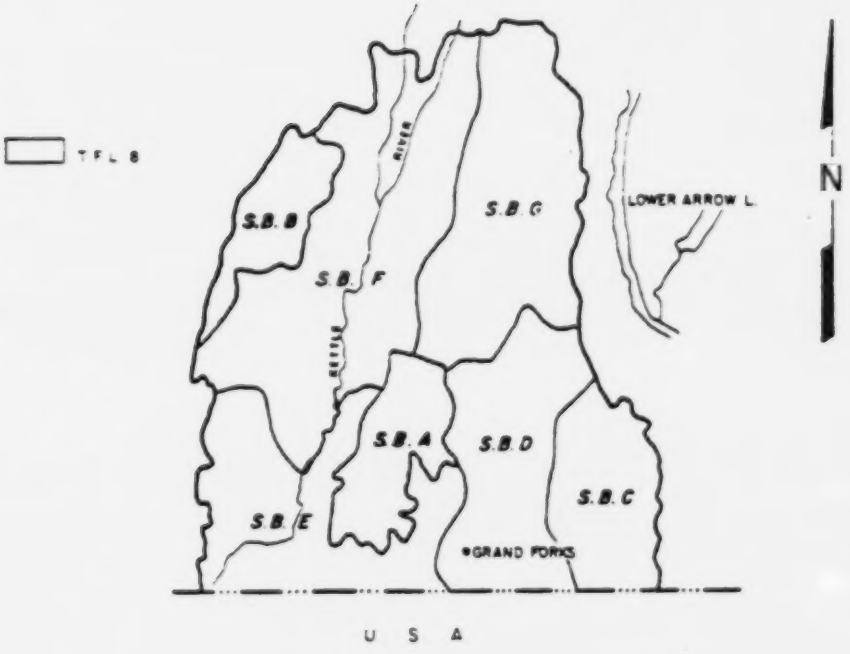
The topography of the TSA varies from mountainous to undulating to flat in the valley bottoms. The boundaries are formed by the Monashee Mountains on the east and Okanagan Highlands on the west. Two main river systems flow through the TSA - the Kettle and Granby Rivers. These rivers flow from north to south.

2.3 Supply Blocks

The Boundary TSA is divided into seven Supply Blocks on the basis of transportation routes, forest characteristics, and harvesting methods (Figure 3). Supply Blocks A and B define Tree Farm Licence (TFL) #8 which is not considered in the TSA Yield Analyis.

Figure 3

BOUNDARY TIMBER SUPPLY AREA



2.4 Supply Area

The total supply area in the TSA (not including TFL 8) is 186 000 hectares (ha). A breakdown by supply block in shown in Table 8 and Figure 9 in the Appendix.

3.0 TIMBER DEMAND

Major sawmills in the Boundary TSA are located at Grand Forks, Midway and Christina Lake. The combined capacity of these sawmills and other licencees is 751 000 cubic metres per year.

The current timber allocation by PSYU is shown in Table 1. Based on 1980 figures it was determined that small operators (those without a timber allotment) had a combined timber usage of 4 800 cubic metres. Sandner Brothers, Christina Lake, are presently milling wood from the Arrow TSA.

Table 1

CURRENT TIMBER ALLOCATION
(cubic metres)

Licensee	Kettle PSYU		Granby PSYU		Total
	Quota Plus Close Utilization	Additional Third Band	Quota Plus Close Utilization	Additional Third Band	
Pope & Talbot Ltd.	135 520	77 200	111 730	117 700	442 150
Chard L.	2 080	--	--	--	2 080
Hilmoe For.Prod.Ltd.	980	--	--	--	980
James Forshaw Ltd.	7 670	--	760	--	8 430
Kelly,T.J.	640	--	--	--	640
Kettle River Sawmills Ltd.	3 020	--	--	--	3 020
Weyer-haeuser Canada Ltd.*	88 960	46 980	--	--	135 940
Bannert,W.	--	--	420	--	420
Hamagami, T.T.	--	--	680	--	680
Starchuk, P.	--	--	1 850	--	1 850
Totals	238 870	124 180	115 440	117 700	596 190

*Weyerhaeuser presently not operating within Boundary TSA.

These mills create employment for 1,146 * people directly and 1,433 people indirectly. In 1980 the total return on forest product sales was estimated at $45,000,000.

The demand for timber in the Boundary TSA is expected to increase in the future. Interest shown to date in the Small Business Program warrants consideration of a timber allocation for this program.

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* 1980 Timber Administration Report for Nelson Forest Region

4.0 TIMBER SUPPLY

4.1 General Comments

Since the inventory, some areas have been logged or burned, and are now fully restocked, while others are not satisfactorily restocked (NSR). Land has been taken out of timber production for other purposes such as road and utility rights-of-way and recreation. Table 2 shows the area of productive forest land in the Boundary TSA at the time of inventory.

Table 2
AREA CLASSIFICATION* - BOUNDARY TSA

Classification	Hectares
Alienated	65 800
Crown - Non forest	91 700
Sub-Total	157 500
Crown Forest:	
- Mature	98 900
- Immature	298 800
- Residual	8 100
- NSR	12 800
- DSD	4 100
- NC	700
Sub-Total	423 400
Total	580 900

* Area classification is a current estimate based on the last forest inventory. Mature forest area includes lodgepole pine and deciduous stands over 80 years and all other species types over 120 years.

Not all of the timber on the forested area is available for harvesting. Some of the land supports deciduous volume which is not commercially used at present. Other lands have such low volume that they are uneconomic to harvest. Areas with steep slopes, unstable or easily erodible soils should be avoided until harvesting methods and technology are improved. In areas with high values for recreation, water, fisheries or wildlife, harvesting will be planned to protect these values.

4.2 Development of the Short-Term Supply

4.21 Inventory Update

The latest inventories for the Kettle and Granby PSYUs were completed in 1977 and 1967, respectively. Each PSYU was updated to December 31, 1979 for number of hectares logged, burned or regenerated since date of inventory.

4.22 Reduction for Waste and Breakage

The inventory volumes are gross merchantable volumes less decay. They are further reduced for unavoidable waste and breakage using species reduction factors (Table 9, Appendix). These factors were determined from volume and decay studies and local knowledge.

4.23 Reduction for Environmental Protection Areas (EPAs)

EPAs are areas that are environmentally sensitive or have high values for other uses (e.g. - recreation, wildlife, water, etc.). Two levels of EPA are recognized: EPA1 and EPA2.

EPA1 areas are those areas considered so sensitive or valuable for other uses that 90 percent of the volumes associated with them are withheld from harvesting (high constraint EPA).

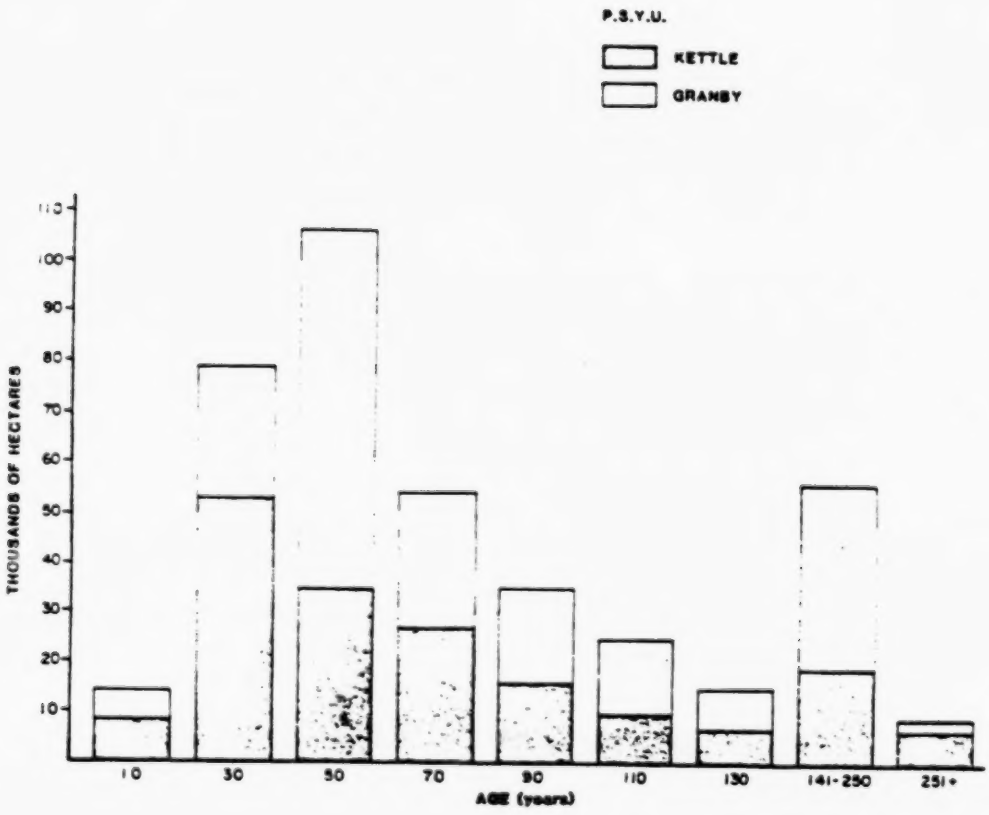
EPA2 areas are those areas with significant values for other purposes but are less critical than EPA 1 areas. EPA2 areas are considered conditionally harvestable, subject to appropriate prescriptions that protect the other existing values. As such, no areas in EPA2 are withheld from consideration for harvesting.

4.24 Reduction for Non-Operable Area

In addition to the long term view taken by the EPA program, it was recognized that short term economics had to be considered. Therefore, an "operability" line, known as an "EPF" line was drawn to show where the upper limit of harvesting would be likely to occur during the 20-year planning period. Operable forest area is shown by its age class distribution in Figure 4.

Figure 4

AREA DISTRIBUTION OF OPERABLE FOREST



4.25 Calculation of Mature Volumes

The mature timber for this analysis consists of the stands already mature at the time of the inventory plus those becoming old enough to harvest by the end of the short term planning period (ingrowth). Minimum harvesting ages are shown in Table 3.

Table 3

MINIMUM HARVESTING AGES

Species	Site Good	Medium (Years)	Poor
Fir - Larch, Yellow Pine, (F,L,Py) White Pine (Pw)	80	100	120
Cedar - Hemlock (C,H)	90	110	130
Spruce - Balsam (S,B)	90	110	130
Lodgepole Pine (Pl)	70	70	70

4.26 Other Short-Term Reductions

After calculation of the mature operable volumes, reductions were made to remove all volume on low sites *, all deciduous volumes and volume presently being bypassed in problem forest types. Further reductions were made to account for non-recoverable losses expected to result from fire, insects, (Mountain Pine Beetle, Balsam Bark Beetle), windthrow and loss of timberland to various rights-of-way and alienation to nontimber uses. A summary statement is shown in Table 4.

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* Low Site as identified during forest inventory.

Table 4
SHORT-TERM VOLUME ADJUSTMENTS*

Category		Volume m3
Reductions:		
Deciduous Types		262 700
Deciduous Component (in Coniferous Types)	217 288	400 000
Low Sites		11 600
Problem Forest Types		
- Hemlock		758 300
- Balsam		21 100
- Spruce		7 800
- Pine		2 041 800
Environmental Protection Areas Withheld		1 756 500
- EPA-EPF Difference		722 100
Non-Recoverable Losses		209 700
Total Reductions		6 191 600
Additions:		
Growth in Mature Trees Since Date of Inventory		2 179 100
Immature Forest Becoming Mature		12 255 400
Coniferous Component in T.G. 41 (Aspen Coniferous)		23 600
Total Additions		14 458 100
Net Increase		8 266 500

*Estimated from mature area only.

4.27 Resulting Short-Term Supply

The adjustments to the gross inventory result in a determination of volume considered harvestable in the period 1980-1999, before applying accessibility factors and site management prescriptions. The short-term supply by species, age, and supply block is shown in the Appendix and a summary (Table 5 and Figure 5) is shown below.

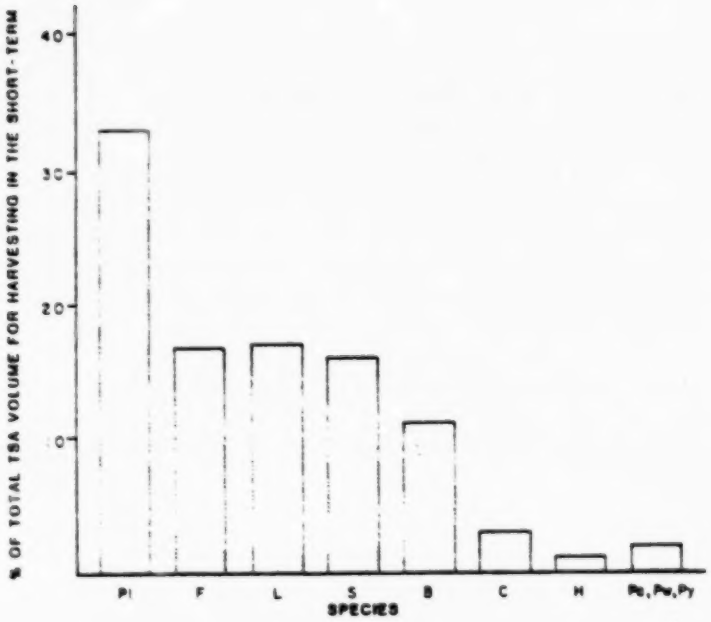
Table 5

SHORT-TERM SUPPLY VOLUME

Leading Species	Volume, Cubic Metres
Spruce (S)	5 750 804
Douglas fir (F)	6 987 688
Lodgepole pine (Pl)	12 044 372
Cedar (C)	821 407
Hemlock (H)	341 898
Balsam (B)	3 513 439
Whitepine (Pw)/Whitebark pine (Pa)	95 498
Yellow pine (Py)	413 503
Larch (L)	4 918 286
Total	34 886 895

Figure 5

NET MATURE (SHORT-TERM) SPECIES DISTRIBUTION



4.3 Constraints on Short-Term Supply

Once the net short-term supply was determined, the following constraints were applied to derive the proportion that is available for harvest.

4.31 Access Limitations

In the Boundary TSA not all stands are presently accessed, i.e. roads are not yet built even though the timber is considered harvestable. Estimates were made of what timber is likely to be accessed by five-year periods during the first twenty years.

4.32 Cut-Leave Ratio

This is the proportion of volume harvested to volume left standing expressed as a percentage of the total stand volume.

4.33 Delay Period

This is the interval in years between successive harvesting entries.

By varying the level of cut and rate of re-entry, it is anticipated that the watershed, wildlife and recreational values can be maintained.

5.0 SHORT-TERM SCENARIOS

5.1 Scenario 1

This is the basic scenario using the short-term available supply developed in Section 4. It indicated that a volume of 841 282 cubic metres per year could be harvested in the short-term.

5.2 Scenario 2

This scenario assumed that the accessibility in Supply Block C was further reduced by 25 percent to consider increased recreational and watershed constraints. It indicated that a volume of 833 591 cubic metres per year could be harvested in the short term.

5.3 Discussion of Short-Term Scenarios

Scenario 1 indicated an available volume for harvesting 41% higher than the present commitment level (596 190 cubic metres per year).

Scenario 2 indicated an available volume for harvesting 40% higher than the present commitment level which is a reduction of 1% or 7 700 cubic metres per year over Scenario 1.

The scenarios examined by no means limit the choice of management options. Prior to the next five year review, studies will be done to provide more information as to other possible scenarios. Table 6 shows a summary of the volumes available for harvesting in the TSA.

Table 6

VOLUME DETERMINED FOR HARVEST
IN THE SHORT-TERM (20 YEARS)

Scenario	Total	(Annual)
	Cubic Metres	
1	16 824 840	(841 282)
2	16 672 000	(833 591)

Note: Present annual commitment is 596 190 cubic metres.

6.0 LONG-TERM HARVEST SCHEDULING

6.1 General

The long-term analysis maximizes the timber harvest. The objective was to examine alternative levels of harvest, the potential for maintaining these levels, and their relation in the long-term to the Long Run Sustainable Yield (LRSY). The LRSY is defined as the amount of wood the TSA is capable of producing per year.

The long-term analysis uses Timber RAM (Resource Allocation Model). This model maximizes the volume harvested over the long term, (200+ years) subject to the following constraints.

For the first five decades, combinations of management prescriptions and physical accessibility were applied, similar to the short-term analysis. In the long-term analysis it was assumed that all drainages are fully accessed after five decades. A major constraint was the upper and lower limits put on the harvest level. The short-term harvest levels were constrained to show the effect that harvesting at those specified levels have on the long-term supply.

It may not be possible to follow the harvest schedule as indicated by Timber RAM for social and environmental reasons. Planning at the operational level must take this fact into account.

6.2 Long-Term Harvest Alternatives

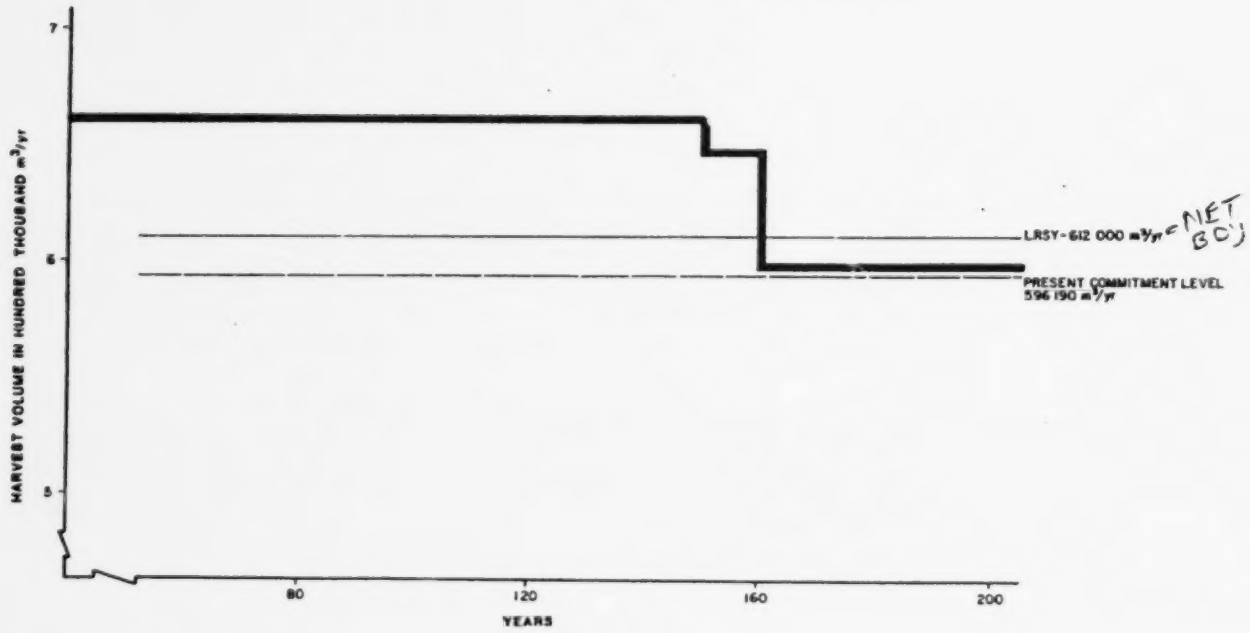
The following long-term scenarios examined alternative rates of harvest.

6.21 Scenario 1

This scenario examines the effect of harvesting at a rate of 662 000 cubic metres per year, (11 percent higher than present Crown commitment). This projection, (Figure 6) shows that it is possible to harvest at this rate for 150 years before declining.

Figure 6

PROJECTED HARVEST LEVEL
AT RATE OF 662 000 CUBIC METRES PER YEAR

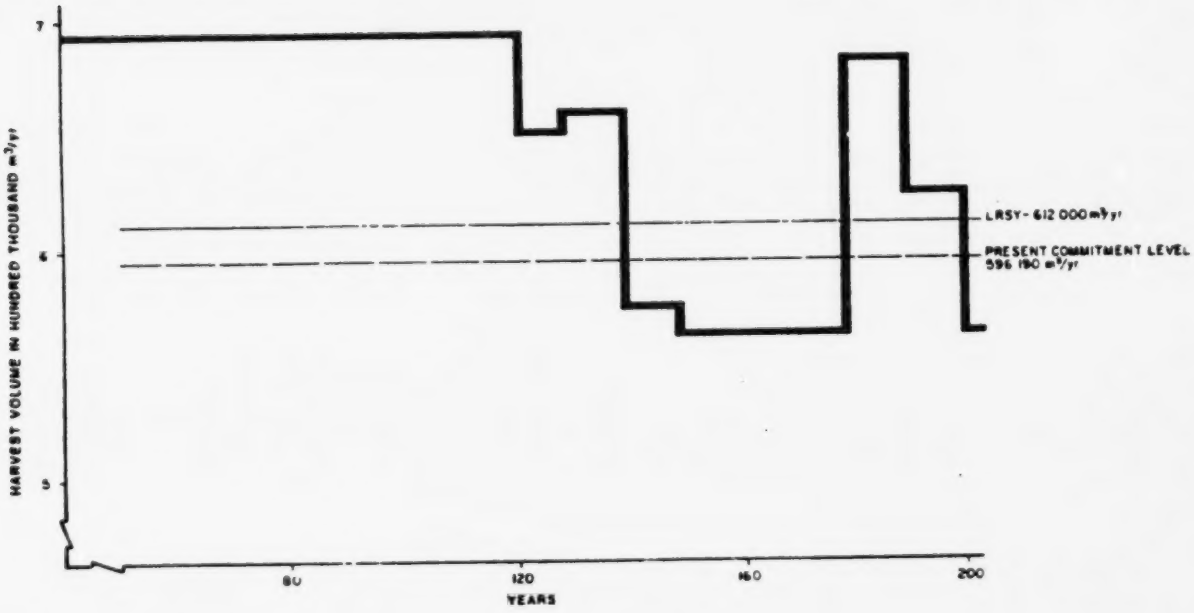


6.22 Scenario 2

This scenario examines the effect of harvesting at a rate of 695 000 cubic metres per year (16 percent above present Crown commitment). This projection (Figure 7) shows that it is possible to harvest at this rate for 120 years before declining.

Figure 7

PROJECTED HARVEST LEVEL
AT RATE OF 695 000 CUBIC METRES PER YEAR

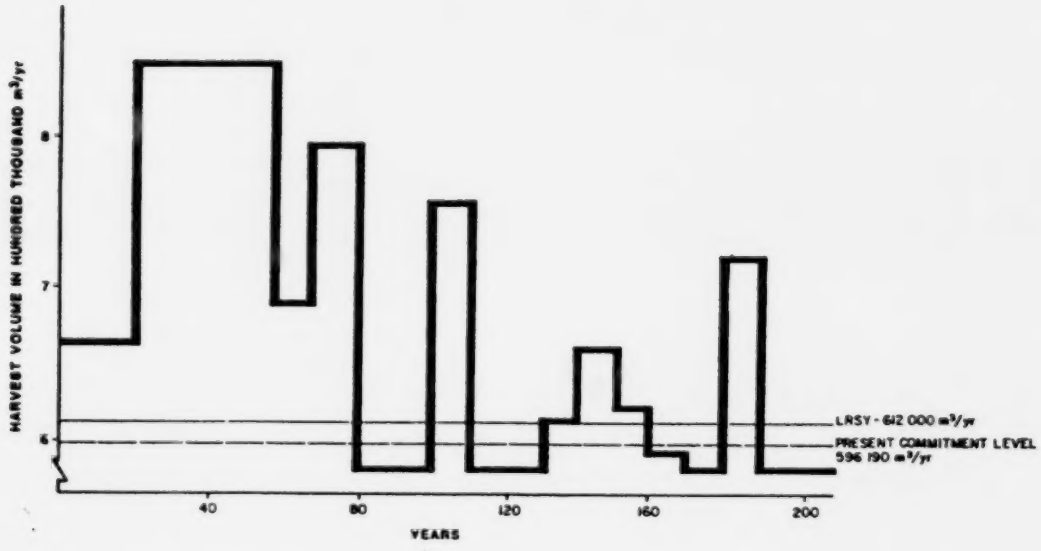


6.23 Scenario 3

This scenario examines the effect of harvesting at a rate equal to the volume indicated by the short-term Scenario 1. This higher rate was shown to be obtainable from year 30 to year 60 (Figure 8). A lower rate of harvest was experienced in the first 20 years as a result of the accessibility constraints. After 60 years the harvest rate dropped significantly.

Figure 8

PROJECTED HARVEST LEVEL
AT RATE OF 849 000 CUBIC METRES PER YEAR



6.3 Discussion of Long-Term Scenarios

The present Crown commitment (in the Kettle and Granby PSYU's) can be maintained for longer than 160 years. The LRSY is somewhat higher than that level of Crown commitment (2.7%).

The higher the short-term harvest level the sooner the 'falldown' occurs and the longer the magnitude of the drop in harvest.

6.4 Falldown Effect

After the areas with "old growth" are harvested the new crop will not be allowed to grow beyond maturity. As the new crops will be harvested at a younger age, this will result in the harvest of a lower volume of timber per hectare, as compared with the harvest volume of "old growth" timber. This is called "the falldown effect".

7.0 OPPORTUNITIES FOR EXPANSION OF TIMBER SUPPLY

Major possibilities for increasing the long term fibre yields* are discussed below.

7.1 Restocking the Not Satisfactorily Restocked (NSR) Areas

Presently there are 12 800 hectares of NSR area in the TSA (Table 7).

Table 7

NSR AREA

Site	Area(ha)
Good	1 500
Medium	6 100
Poor	5 200
Total	12 800

If restocked it is estimated that this area could yield 26 600 cubic metres per year.

7.2 Use of Problem Forest Types

Hemlock - Cedar

The Boundary TSA contains approximately 3 100 hectares of decadent hemlock - cedar timber stands containing approximately 1 083 300 cubic metres of timber. Of this

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* Based on an average annual growth rate of 2.08 cubic metres per hectare.

volume, 758 300 cubic metres or (70 percent) is not considered economic to harvest at present due to the small recoverable volume of merchantable timber. As well, the sawmills in the TSA are not equipped to process most of this timber. These areas could be rehabilitated and brought back into production. The potential increase in yield of the 2 200 hectares of decadent hemlock - cedar sites withheld from the analysis is approximately 4 600 cubic metres per year.

Balsam - Spruce

Overmature balsam and spruce types have a reduction applied for those stands of low height and merchantability. This amounts to a volume of 29 000 cubic metres in the short term. These sites have the potential for increasing the long term yield by 1 000 cubic metres per year.

Lodgepole Pine

There are 35 000 hectares of lodgepole pine defined as problem forest type. Of this 35 000 hectares there are 370 hectares of good site, 20 000 hectares of medium site and 14 700 hectares of poor site. These stagnated, high density stands have potential for use as chips or, if managed, for use as other products. The potential yield of this area is approximately 73 000 cubic metres per year.

7.3 Improved Utilization

Improved recovery in harvesting operations could provide an increase in supply. Improvements in milling technology could increase the volume of wood products. Significant changes in utilization are not anticipated during the next five years unless regional pulpwood demand increases.

7.4 Intensive Forestry

Rehabilitation of good quality forest land that is currently less than fully productive should be top priority. In addition to restocking NSR areas the spacing and thinning of immature larch, fir and lodgepole pine stands could increase the long term timber yield and quality. The costs and benefits of these types of programs are presently being investigated. A substantial increase in present expenditures is needed if intensive forestry is to be

practiced.

7.5 Veteran Volume

Veteran trees are trees with an age of 40+ years above that of the main stand. Volume from these trees is not included in Table 11. It is estimated that 328 000 cubic metres can be recovered from these trees.

8.0 CONCLUSION

There is sufficient volume in the Boundary TSA in the short term to permit an increase in harvest. This assumes that the present protection program will continue to minimize losses from fire and that the spread of Mountain Pine Beetle infestation can be controlled. Harvesting of "veteran" trees in immature stands could provide an additional source of supply in the short-term.

The present Crown commitment in the Kettle and Granby PSYU's is slightly below the LRSY of the Boundary TSA.

GLOSSARY

Annual Allowable Cut (AAC)
The AAC is the annual rate of harvest set for a managed unit. The term also applies to the annual volume that can be cut from a forest licence.

Basic Forestry
Maintenance of the productivity of forest site, restocking of denuded forest lands with commercial tree species within three years of logging for area west of the Coast Range and five years for areas in the Interior, protection against damage by fire, insects and diseases to predetermined standards.

Culmination Age
The age at which a species reaches its maximum mean annual increment.

Environmental Protection Area (EPA)
An area designated during the forest inventory process as being environmentally sensitive or critically valuable for other uses (e.g. recreation, water, wildlife, etc.) and deserving special attention.

Environmental Protection Forest (EPF)
Commercial forest that is inoperable with present harvesting technology and economic conditions.

Forest Land - as per Section 4 of Forest Act
Land with a productive capacity suited to the growing of forest crops. Such land may or may not be presently supporting a commercial forest.

Intensive Forestry
Any silvicultural practice beyond the basic level which results in enhanced forest growth. Includes such practices as thinning and fertilizing.

Long-term
For the purpose of this analysis, it is considered to be 200 years.

Long Run Sustainable Yield (LRSY)
The volume of harvest that can be sustained from the productive forest sites with only minimal or basic silvicultural treatments. It is calculated from the volume available at the culmination of the mean annual increment.

Mean Annual Increment
The average annual growth per hectare on a forest stand.

Non Recoverable Losses (NRLs)
NRLs are of two main types in this analysis:

a) natural losses due to fire, insects and windthrow which cannot be salvaged, and
b) loss of the forest land base from timber production due to alienation or reservation for non-forestry purposes. These losses include rights-of-way for permanent roads, as well as lands reserved or removed for dam pondage, utilities, gravel pits, etc.

Not Satisfactorily Restocked (NSR)
An NSR area is one that has been more than 75 percent disturbed by fire, logging, etc., and has not been restocked to an acceptable level with commercial species.

Old Growth Timber
Timber which is beyond its peak growing period. Depending on how far beyond its peak growth, it may also be referred to as "mature, overmature, or decadent".

Old Temporary Tenure
A form of timber harvesting licence or tenure dating back 80 years or more. These are being phased out under the current Forest Act.

Region
There are two uses of this term: the administrative unit which is the first level below the Province as a whole; e.g. Nelson Forest Region; also used to define an inventory area or grouping of compartments.

Regeneration Delay
The number of years between harvesting and the successful establishment of a specified number of trees on the site.

Rotation
The period of years required to establish and grow timber crops to a specified condition of maturity.

Second Growth Timber
The crop of trees resulting after timber is removed from an area that has never been logged before. This crop may be planted or it may have grown from natural regeneration.

Short-term
The first 20 years of the TSA analysis. It is comprised of four 5-year periods.

Supply Block
A more or less homogeneous area with respect to transportation route, forest and harvesting characteristics.

Timber Supply Area (TSA)
A specified area of the Province identified by the Ministry of Forest for the purpose of analyzing, planning and managing timber resources. Boundaries have been established considering present and expected population centres, transportation network and manufacturing facilities.

Yield Analysis
The study of potential forest yield in future time periods.

APPENDIX

Table 8

FOREST AREA BY SITE AND SUPPLY BLOCK

Supply Blocks	Hectare/Site Good	Medium	Poor	Total Area
C	2 215	12 570	957	15 742
D	2 520	15 080	3 726	21 326
E	996	17 298	5 655	23 949
F	8 075	58 481	17 218	83 774
G	7 073	20 420	13 648	41 141
Total TSA	20 879	123 849	41 204	185 932

Figure 9

SITE DISTRIBUTION

Table 9

UNAVOIDABLE WASTE AND BREAKAGE FACTORS (SHORT-TERM)*

Supply Block	Species C	H	S	Pw	B	F	L	Pl	Py
C	0.896	0.907	0.970	0.968	0.937	0.972	0.961	0.973	-
D	0.840	-	0.976	-	0.949	0.975	0.957	0.960	-
E	0.980	-	-	-	-	0.976	0.966	-	-
F	0.839	-	0.972	-	0.917	0.973	0.954	0.949	0.972
G	0.819	0.902	0.969	0.960	0.920	0.976	0.949	0.963	-

* Based on Regional data

Table 10A

SHORT-TERM VOLUME DISTRIBUTION* (METRIC UNITS)

Supply Block	Species								
	Pl	S	B	H	F	C	L	Pa,Pw,Py	Total
C	641 761	433 207	205 753	58 174	1 087 628	224 716	836 760	87 630	3 575 359
D	1 401 725	287 942	201 887	47 275	1 089 891	146 542	984 600	42 620	4 202 482
E	1 244 982	273 970	129 794	7 411	983 172	19 251	692 072	42 210	3 392 862
F	5 965 622	2 910 301	1 833 964	35 892	2 029 221	98 334	1 977 805	138 458	14 989 597
G	2 598 693	1 971 319	1 623 175	338 374	882 875	444 581	1 539 578	298 801	9 697 396
Total	11 852 783	5 876 739	3 994 573	487 126	6 072 787	933 424	6 030 815	609 449	35 857 696
Percent	33.1	16.4	11.1	1.4	16.9	2.6	16.8	1.7	100.0

* Includes: Coniferous volume in Aspen-Coniferous Types
Volume for Pl (Lodgepole pine) down to 12.5 cm diameter
Does not include deciduous component

Table 10B

SHORT-TERM VOLUME DISTRIBUTION* (IMPERIAL UNITS)

Supply Block	Species								
	Pl	S	B	H	F	C	L	Pa,Pw,Py	Total
C	226 635	152 986	72 661	20 544	384 093	79 358	295 499	30 851	1 262 627
D	495 015	101 686	71 296	16 695	384 892	51 751	347 708	15 051	1 484 094
E	439 662	96 752	45 836	2 617	347 204	6 798	244 403	14 906	1 198 178
F	2 106 742	1 027 764	647 659	12 675	716 613	34 726	698 456	48 896	5 293 531
G	917 721	696 165	573 219	119 496	311 785	157 002	543 697	105 521	3 424 606
Total	4 185 775	2 075 353	1 410 671	172 027	2 144 587	329 635	2 129 763	215 225	12 663 036
Percent	33.1	16.4	11.1	1.4	16.9	2.6	16.8	1.7	100.0

* Includes: Coniferous volume in Aspen-Coniferous Types

Volume for Pl (Lodgepole pine) down to 5.1" diameter

Table 11

SHORT-TERM TYPE GROUP AGE DISTRIBUTION BY LEADING SPECIES*

SPECIES GROUP	70	80	90	100	110	120	130	140	150	151-250	251+	TOTAL
F		23 180	63 059	1 725 309	940 656	630 591	983 032	427 431	411 885	1 719 176	63 369	6 987 688
L		135 127	112 240	1 200 971	819 353	569 347	295 319	292 204	308 534	1 023 196	161 995	4 918 286
C			2 583		70 766		57 291		21 594	331 327	337 846	821 407
H					2 722	4 000	10 205		9 223	182 990	132 758	341 898
B			631	826	141 962	166 561	109 154	81 018	44 064	2 821 298	147 925	3 513 439
S			69 165	28 084	475 331	690 535	267 519	360 919	365 369	2 921 584	572 298	5 750 804
Pl	4 570 157	1 931 210	1 172 403	1 846 267	519 018	1 009 994	107 615	257 264	92 870	535 133	2 441	12 044 372
Pw/Pa			4 740		59 241		20 918		2 002	8 597		95 498
Py		5 411	4 075	7 383	3 183	4 689	381 767		1 028	5 967		413 503
Totals	4 570 157	2 094 928	1 428 896	4 808 840	3 032 232	3 075 717	2 232 820	1 418 836	1 256 569	9 549 268	1 418 632	34 886 895
Percent	13.1	6.0	4.1	13.8	8.7	8.8	6.4	4.1	3.6	27.4	4.0	100.0

* Volume includes all species associated with the leading species, includes deciduous component

Not including - additional Pl volume down to 12.5 cm diameter
- coniferous volume in Aspen-Coniferous types

Table 12A

SHORT-TERM (20 YEAR) VOLUME AVAILABLE* (METRIC UNITS)

Scenario	Cubic Metres/Supply Block C	D	E	F	G	Total
1**						
20 year	734 787	2 190 128	1 655 232	8 429 971	3 815 507	16 828 625
1 year	36 740	109 506	82 762	421 499	190 775	841 282
2***						
20 year	580 980	2 190 128	1 655 232	8 429 971	3 815 507	16 671 818
1 year	29 049	109 506	82 762	421 499	190 775	833 591

* Available: Volume available after Management Prescription, Accessibility, and Delay Period Applied

** Basic

*** Reduced Access

Table 12B

SHORT-TERM (20 YEAR) VOLUME AVAILABLE* (IMPERIAL UNITS)

Scenario	Cubic Feet/Supply Block C	D	E	F	G	Total
1**						
20 year	259,488	773,437	584,540	2,977,019	1,347,435	5,941,919
1 year	12,975	38,672	29,227	148,851	67,372	297,097
2***						
20 year	205,171	773,437	584,540	2,977,019	1,347,435	5,887,602
1 year	10,258	38,672	29,227	148,851	67,372	294,380

* Available: Volume available after Management Prescription, Accessibility and Delay Period Applied

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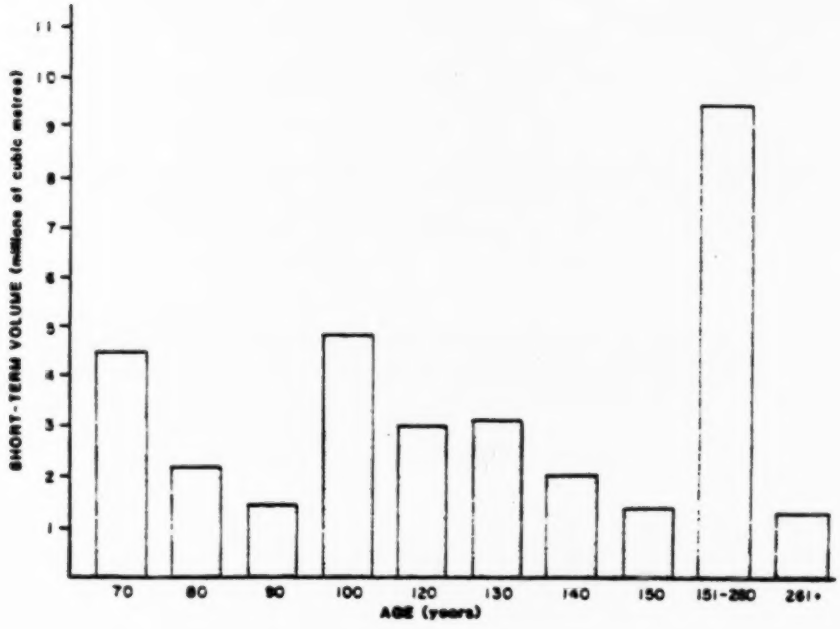
Figure 10

SHORT-TERM VOLUME DISTRIBUTION BY AGE



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